

IN THE CLAIMS

Please amend Claim 1 as shown. Please cancel Claims 15 through 22. Please add the following new Claims 23 through 29. A complete listing of the current claims of the present application are as follows:

1.(currently amended) A tomographic sensor array for mounting on a support within a vessel to enable conditions, within the vessel remote from ~~that support~~ the sensor array, to be monitored, comprising a sheet carrying an array of sensors and conductors connecting the sensors to at least one output through which signals may be transmitted which are representative of conditions within the vessel.

2.(previously presented) A sensor array according to claim 1, wherein the sheet is laminar and the conductors are defined by conductive elements deposited on an insulating substrate.

3.(original) A sensor array according to claim 1, wherein the sheet comprises interengaged elongate elements and the conductors are defined by conductive elements within the sheet, the conductive elements being supported by non-conductive elements within the sheet.

4.(previously presented) A sensor array according to claim 2, wherein the conductive elements are covered by an electrically insulating layer.

5.(original) A sensor array according to claim 4, wherein the sensors are covered by the electrically insulating layer.

6.(previously presented) A sensor array according to claim 1, wherein the sheet is flexible.

7.(previously presented) A sensor array according to claim 1, wherein the sheet comprises a series of sections which are interconnected such that at least some of the conductors extend across the interconnections between the sections.

8.(previously presented) A system for monitoring conditions within a vessel a wall of which defines an enclosed space, comprising a sensor array in accordance claim 1, wherein the sensors are distributed within the vessel, a first monitoring unit is located within the vessel and connected to each of the sensors, and a second monitoring unit is located outside the vessel, the first monitoring unit comprising means for converting sensor output signals into transmission signals which are transmissible through the vessel wall, and the second monitoring unit comprising means for detecting the transmission signals outside the vessel walls and deriving data representative of conditions within the vessel from the transmission signals.

9.(original) A system according to claim 8, wherein means are provided for transmitting a power signal from outside the vessel to the first monitoring unit, the first monitoring unit comprising a detector arranged to detect the power signal and a power supply energised by the detected power signal.

10.(original) A system according to claim 9, wherein the first monitoring unit comprises an antenna and an associated detector circuit tuned to a predetermined frequency, and a power signal is transmitted at the predetermined frequency.

11.(previously presented) A system according to claim 8, wherein the vessel incorporates a window, and the first monitoring unit is arranged to transmit optical transmission signals through the window to the second monitoring unit.

12.(original) A system according to claim 11, wherein the first monitoring unit comprises a laser to generate the optical transmission signals.

13.(previously presented) A system according to claim 11, wherein the optical transmission signals are infra-red signals.

14.(previously presented) A system according to claim 8, wherein the transmission signals are radio telemetry signals to which at least a part of the vessel wall is transparent.

15 - 22.(cancelled)

23.(new) A sensor array according to claim 1, wherein the conditions within the vessel are monitored by measurement of a property between one sensor in the array and any one or more of the other sensors in the array.

24.(new) A sensor array according to claim 23, wherein the property is an electrical property.

25.(new) A sensor array according to claim 1, wherein the conditions within the vessel are monitored by at least one sensor within the array transmitting and subsequently receiving a signal.

26.(new) In a vessel having an interior region and an exterior region, an apparatus for monitoring one or more properties of a material disposed within said interior region comprising:

a plurality of sensors disposed on a flexible substantially flat substrate in a predetermined orientation, said substrate being selectably disposed within said interior region of said vessel, said sensors providing an output indicative of said one or more properties ^{of} said material;

first monitoring means disposed within said interior region of said vessel and connected to said sensors for receiving said output from said sensors, said first monitoring means further comprising transmitting means for transmitting information related to said output;

second monitoring means disposed within said exterior region of said vessel and adapted for receiving said information transmitted from said first monitoring means.

27.(new) The apparatus described in claim 26, wherein the placement of said substrate within said vessel is selected based on one or more physical characteristics of said vessel.

28.(new) A method for monitoring one or more properties of the contents of a vessel comprising the steps of:

providing a plurality of sensors disposed on a flexible substantially flat substrate in a predetermined orientation;

selectably positioning said substrate within said contents of said vessel such that said sensor provide an output indicative of said one or more properties said contents of said vessel;

providing first monitoring means disposed within the contents of said vessel and connected to said sensors for receiving said output from said sensors and transmitting information related to said output; and

providing second monitoring means disposed about the exterior of said vessel and adapted for receiving said information transmitted from said first monitoring means.

29.(new) The method of claim 28, wherein said positioning of said substrate is determined in response to one or more physical characteristics of said vessel.